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Installation, Operation and Maintenance Instructions for the Hydropneumatic Booster Set.

Please fulfil all listed requirements prior to and during installation and operation of all equipment to prevent invalidation of any warranty given.

General Installation

Site Location
During off loading and positioning of the booster set care must be taken only to lift via the base frame and not the pipework, pumps or vessel/s.

The unit location should be undercover, dry and freely ventilated. Protection from frost must be ensured.

Provision should be made for the disposal of system drained water.

Reasonable access to all parts of the set and adequate service work space must be provided. Provision for lifting equipment is recommended for units incorporating large pumps.

The floor base should be firm and level in all directions, and points are provided for floor fixing if desired. Isolation of the set if required should be antivibration matting beneath the frame together with pipework flexibles.

All system pipework should be aligned and self supporting preventing any strain or distortion within the unit.

Water Supply
The stored water should be clean and free from any foreign materials. There should be nothing suspended or dissolved to block or wear the pump internal components.

The water storage tank should provide all the pumps with a fully flooded suction (with the exception of self priming sets) at all times irrespective of water level within the tank.

All self priming sets should be fitted at the water source with a good quality foot valve complete with stainless steel strainer, all suction pipework runs should be sited to avoid any air pocket traps and be fitted with at least one positive/negative automatic air vent.
Pipe sizing should be to suit length of run and booster set net positive suction head requirements.

Isolating Valves
If final isolating valves are not supplied with the unit we strongly recommend the fitting of these and unions to facilitate any service work necessary.

Electrical

Connections to unit
The supply should be brought to the set with suitable trunking or armoured cable, with trunking we recommend that the final metre is converted to flexible conduit to avoid any undue stress or fatigue to the unit.

All supply cables should be sized accordingly to accommodate any voltage drop due to long cable runs for all pumps running simultaneously.

Voltage at the unit should be to the stated supply voltage on the specification. A neutral supply is required for all panels.

It is recommended that an independent isolator is fitted adjacent to the unit.

Supply fuses should be rated for the size of the pump motor multiplied by the number of pumps within the booster set. (Please refer to specification for Kw and F.L.C. details).

The control panel when fitted has its own individual pump protection.

All equipment should be earthed.

After priming of the unit, pump rotation must be checked and phases changed if necessary to prevent damage and lack of pump performance. Rotation should also be checked after any electrical maintenance work within the building.

All connections should be performed by a competent electrical conversant with the panel wiring diagram.

Start Up

Air Checks

Before suction isolation valves are opened all hydraulic accumulator/s air pressures should be checked (if fitted) and adjusted using a car tyre pressure gauge, foot pump or oil free compressor. Access is via the schrader valve under the cover cap. Please refer to the vessel label or booster set specification sheet for pressure required.

Priming

After flooding the suction line all the pumps should be primed and vented. On vertical multistage pumps these should have individual vent plugs loosened to allow air purging and water flow to each priming point, this may have to be repeated if poor pump performance is experienced due to trapped air pockets.
On certain horizontal end suction pumps these too may have a vent plug, but if not fitted air should be allowed to evacuate via a suitable point of the discharge pipework, e.g. a drain cock, tap etc.
NEVER RUN ANY PUMPS EVEN TO CHECK ROTATION BEFORE COMPLETE PRIMING IS ACHIEVED.

Check the operation of the storage tank low level float switch where fitted. If one is not being installed link out the relevant panel connections to allow the set to run.
Check all valves with the exception of the final discharge are open. Switch on the main isolating switch; the power on lamp should now be illuminated. Briefly run each pump in the HAND position to check rotation to correspond with the pump casing arrows. If incorrect the electrical supply phases should be changed accordingly.

On correct rotation continue to run the first pump increasing the pressure against the closed valve (indicated by the system pressure gauge), if a lack of pressure rise is experience, shut down the set and re-vent the pump.

On completion switch off the pump, release the pressure through the main valve and then operate the next pump in the same sequence against the closed valve until all the pumps have been run.
On units without hand/off/auto switches the isolation switch should be used, please note, in these cases the pump control pressure switch may stop the pump on pressure rise.

After the pre-operational checks place all switches in the AUTO position and select the duty pump (on models with pump selection switch fitted) and run the pump/s against the closed valve until cut out by the control pressure switch/es. On short demands these may be overridden by the run on timers (if fitted) for the set period.
Finally open the valve slowly to the system fulfilling the demand as required.

All units are wet tested and set before despatch and should only need slight pressure switch adjustments if at all, owing to differing site suction conditions. For switch details please refer to information sheet.

Maintenance

Booster sets require very little general maintenance, listed below are quarterly and yearly check schedules.

Quarterly

The hydraulic accumulator should have its internal air charge checked and adjusted to the correct pressure.
It must be stressed that this is only to be performed after switching off the booster set, isolating the accumulator and draining all water present from the internal storage, to obtain a correct pressure reading.

Please refer to the data and start up sheet for air pressure setting and inflating instructions. Failure to successfully reinflate the air charge, or if water is found to be present at the schrader valve would point to a ruptured membrane, this would require immediate replacement.

Check all control panel lamps for blown bulbs, please note, with the small neon type fitted on some sets these do not have replaceable bulbs and if failed require complete unit replacement. (All lamps are only to be charged by a competent person after isolating the panel power supply).

The whole set should be observed for any leaks, particularly the pump shaft seals and the valve glands, if found please contact Flow Mech Products Ltd for a service.
The pumps should be noted for any deviations to their smooth running and performance, again please contact our service department for any assistance required.

If the unit has not been operational for a long period all pumps should be vented as described in the start up information.
If not in use during the winter period and there is any chance of freezing, drain all pumps and pipework and cover with a suitable frost protection covering. Ensure full venting before start up.

Yearly
All quarterly checks are to be performed.

All pumps should have a full load current, and windings test to ascertain pump motor condition.

The pressure switches should be checked and adjusted as required.

All control panel internal components should be observed, (After isolation) and fuses changed, terminals tightened, and run on timer setting checked. All overloads should be tripped and reset to check correct operation.

Non-return valves should have a visual and audible inspection for general wear and sealing.

All gauges are to be inspected for operation and replaced as required.

Electrical cables and conduit are to be checked for cuts or chaffing and to be replaced as necessary (After unit isolation).

It is recommended that all yearly checks are carried out by Flow Mech Products engineers and service contracts are available on request.

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Pressure Switch Information

Not all booster sets are fitted with the same switch. For adjustment details please refer to the relevant instructions applicable.

DANFOSS RT116
This unit is identified by the large front cover with four fixing screws, and the brown body colouring.
The range is set via the top adjusting shaft, which is located under the lockshield cap. Removal is by the centre screw. The differential adjustment is performed inside the unit with the rotating nut numbered 1 to 10. Position 1 = 0.3 bar, which is the minimum. Position 10 = 1.3 bar which is the maximum. The maximum operating pressure is the range + the differential.

DANFOSS KP
Identified by the name plate and wrap round removable cover this switch performs the same as the RT116, but both adjustments controls are sited on the top of the unit. If fitted remove the locking plate to adjust, and refit after setting.

TEDDINGTON TBV

This again is fitted with wrap round cover, but can be identified by the two cross head fixing screws and black locking/adjustable cap fitted. This must be removed together with the locking strip before setting.
Set the range using the right-hand spindle, this will be the cut out setting. The differential is set using the left hand spindle; this valve subtracted from the range will be cut in setting.

Kindly note: Pressure switch scales are not 100% accurate and should only be accepted as reference points.

Pumps control pressure switches can be overridden by run on timers (If fitted) on short system demands.